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# (12) EUROPEAN PATENT APPLICATION

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## (54) Recombinant saccharomyces.

(57) A method is described for cloning and expressing DNA sequences derived from Candida in Saccharomyces; including a method for expressing and secreting heterologous gene products under the control of a signal sequence derived from Candida in Saccharomyces. Also provided are a method for characterizing the function of the Candida DNA sequences, a Saccharomyces host microorganism transformed by the DNA sequences, and a recombinant plasmid useful for performing such transformation.

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# PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application number: EP 89 87 0129

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl 4) |
|---|---|---|---|
| X | EP-A-0 173 668 (SMITHKLINE Beckman Corp.)<br>* Page 15, lines 9-29 *<br>-- | 1-20 | C 12 N 1/18<br>C 12 N 15/81<br>C 12 N 15/62<br>C 12 P 21/02<br>C 12 N 15/49<br>C 12 N 15/25<br>C 12 B 15/31<br>C 07 K 15/00<br>C 12 N 15/19<br>A 61 K 39/10//<br>(C 12 N 1/18,<br>C 12 R 1:865) |
| A | SCIENCE, vol. 229, September 20, 1985, pages 1219-1224 Washington, DC, US; R.A. SMITH et al.: "Heterologous protein secretion from yeast"<br>-- | | |
| X | VACCINE, vol. 5, no. 2, June 1987, pages 90-101, Butterworth & Co. Publ. Ltd., Guildford, GB; P.J. BARR et al.: "Antigenicity and immunologenicity of domains of the human immunodeficiency virus (HIV) envelope polypeptide expressed in the yeast Saccharomyces cerevisiae"<br>* Figure 2 * ---------- | 22-24 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

C 12 N
C 12 P

## INCOMPLETE SEARCH

The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims.

Claims searched completely: 1-32,34-39

Claims searched incompletely:

Claims not searched: 33

Reason for the limitation of the search:

Method for treatment of the human or animal body by surgery or therapy (see Art. 52(4) of the European Patent Convention).

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 10-12-1989 | VAN PUTTEN |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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## CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid.

namely claims:

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

## X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

See annex -B-

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid.

namely claims:

☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims: 1-16,22-24 and 17-20 partially

## LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-16, 22-24 and 17-20 partially:
   A transformed host microorganism of the genus Saccharomyces which comprises a functional DNA sequence derived from the same or substantially the same coding sequence as the signal sequence of the C.albicans glucoamylase gene.
   A recombinant DNA plasmid comprising a functional DNA sequence containing a coding sequence the same or substantially the same as the signal sequence of the C. albicans glucoamylase gene.
   A method of expressing a functional DNA sequence comprising a sequence the same or substantially the same as the signal sequence of the C. albicans glucoamylase gene which comprises transforming a host microorganism of the genus Saccharomyces with the functional DNA sequence, and culturing the transformed host under suitable conditions such that the functional DNA sequence is expressed.
   An HIV-1 glycoprotein gp 160.

2. Claims 21 and 17-20 partially:
   A method of expressing a functional DNA sequence comprising a sequence the same or substantially the same as the promoter sequence of the C. albicans glucoamylase gene which comprises transforming a host microorganism of the genus Saccharomyces with the functional DNA sequence, and culturing the transformed host under suitable conditions such that the functional DNA sequence is expressed.
   A C.albicans glucoamylase gene promoter sequence.

3. Claim 25: TGF-alpha

4. Claim 26-28,31,32,34-39:
   S1-GA protein
   Vaccin comprising this protein
   a recombinant DNA molecule
   A synthetic DNA molecule
   Host cell transformed with this DNA

5. Claim 29: IL1-beta

6. Claim 30: IL1-alpha